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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/864,373	05/25/2001	William F. Krise	KRISE 1A	1608

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Naval Surface Warfare Center
Indian Head Division
101 Strauss Ave., Bldg. D-326
Indian Head, MD 20640-5035

EXAMINER

LUM, LEON YUN BON

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/864,373

Applicant(s)

KRISE ET AL.

Examiner

Leon Y. Lum

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-12, 15 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-12, 15 and 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed 8 April 2005 is acknowledged and has been entered.

Claim Objections

2. Claim 15 is objected to because of the following informalities: It seems as if the phrase "the from" should be "from the". Appropriate correction is required.
3. Claim 18 is objected to because of the following informalities: Its seems as if the term "gobulin" should be "globulin". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 7-12, 15, and 17-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The preamble to claims 7 and 12

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recite "detecting a molecule in vivo or in vitro". The specification teaches a device with a light source, sample holder, and a detector for performing in vitro detection. However, there is no teaching of how the components can be utilized in an in vivo setting and one of ordinary skill in the art at the time of the invention would not recognize that the inventors had possession of an apparatus that can perform in vivo detection of a molecule using the claimed embodiments.

Therefore, the term "in vivo" is considered to be new matter and does not carry patentable weight in the instant claims.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 7-12, 15, and 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. In claim 7, line 10, the term "the molecule" is vague and indefinite. Since the instant claim recites "the molecule" in line 7 and "a capture molecule" in line 10, it is unclear as to whether the instant term refers to "the molecule" or "a capture molecule".

9. In claim 12, line 9, the term "the molecule" is vague and indefinite. Since the instant claim recites "the molecule" in line 7 and "a capture molecule" in line 9, it is unclear as to whether the instant term refers to "the molecule" or "a capture molecule".

10. In claim 12, line 11, the term "an analysis target area" is vague and indefinite. It is unclear whether the instant term refers to the "analysis target area" in line 8 or to another embodiment.

11. In claim 15, lines 5-6, the phrase "the bubble is the analysis target area" is vague and confusing. Since the instant claim discloses that the bubble is on an extension from the uptake channel, which indicates that the bubble is not part of the uptake channel, and parent claim 12 recites that the analysis target area is in "an uptake channel" (line 8), it is unclear how the analysis target area can be in both the uptake channel and bubble since they are separate embodiments. Applicant is invited to clarify the claims.

12. In claim 18, lines 1-2, the phrase "binds electrostatically to albumin, lipoproteins, and gamma globulins" is vague and indefinite. It is unclear whether the laser dye binds to all three embodiments at once or whether the phrase includes a Markush grouping.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 7-9, 11-12, 15, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Zarling et al (US 5,674,698).

Zarling et al reference teaches an apparatus comprising a handheld probe and a container with sample fluid D8 (i.e. sample holder), wherein the handheld probe comprises a diode excitation laser D3 (i.e. light source; laser diode), a photodiode detector D5 (i.e. a detector that detects a dye), and a capture surface D9 within wick D2 (i.e. uptake channel having an analysis target area), wherein the capture surface comprises antibodies covalently linked to the inner surface of the tube wall, (i.e. matrix activated by binding a capture molecule to the matrix), and wherein the capture surface can be at the site of a liquid bubble (i.e. bubble at end of extension). See column 40, lines 5-30 and Figure 29. In addition, Zarling et al teach that the excitation source can be a near-infrared laser diode (i.e. light source that emits near infrared wavelengths) and luminescent materials used as labels which can be linked to a biological probe (i.e. a reagent tag that fluoresces when subject to light emissions; laser dye). Furthermore, Zarling et al teach that the apparatus can have a fiber optic probe (i.e. optical system comprising a lens). See Figure 23. See column 5, lines 40-59. With regards to the limitation "an analysis target area comprising an area free of solid phase" in claim 12, line 11, since Zarling et al teach that the antibodies at capture surface D9 are immobilized only along the inner tube wall of the capillary, the middle of the capillary would be free of solid phase to allow fluid to flow through and therefore meets the instant limitation.

With regards to claim 9, Zarling et al teach bandpass filters for emission bands.
See column 37, line 18.

With regards to claim 11, since Zarling et al teach that the capture surface is constrained within a bubble through silanizing the inner surface of the capillary, regions on either side of the bubble that are not silanized would pose a physical barrier to antibodies that attach only to silanized areas.

With regards to claim 15, Zarling et al teach housing D1 (i.e. reservoir), which is larger than wick D2 (i.e. reservoir having a diameter larger than a diameter of uptake channel), and wherein the housing D1 and tube surrounding the wick (i.e. extension) are connected. See Figure 29. Since housing D1 is capable of holding fluid, it is considered to be a reservoir.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

18. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zarling et al (US 5,674,698) in view of Wohlstadter et al (US 6,066,448).

Zarling et al reference has been disclosed above, and additionally teaches a photodiode detector connected to a display. See Figure 29. However, Zarling et al fail to teach that the photodiode is coupled to a LCD.

Wohlstadter et al teach an array of LCD shutters attached to photodiode detectors, in order to provide a mechanism for controlling errors due to electrical noise inherent in light detectors. See column 25, lines 38-43 and column 26, lines 6-25.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Zarling et al with an array of LCD shutters attached

to photodiode detectors, as taught by Wohlstadter et al, in order to provide a mechanism for controlling errors due to electrical noise inherent in light detectors. The LCD shutters of Wohlstadter et al provide the advantage of reducing errors in the photodiode detectors of Zarling et al. One of ordinary skill in the art at the time of the invention would have had reasonable expectation of success in including the LCD shutters of Wohlstadter et al, in the apparatus of Zarling et al, since Zarling et al teach photodiode detectors, and the LCD shutters of Wohlstadter et al are capable of coupling to photodiode detectors.

19. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zarling et al (US 5,674,698) in view of Ekong et al (Journal of Immunological Methods, 1995).

Zarling et al reference has been taught above, and additionally teaches that the phosphor-probe conjugates are impregnated in a wick that is contacted with sample in liquid (i.e. laser dye is soluble in water), and that the probe-label conjugate can be formed through electrostatic interactions. See column 40, lines 31-36; column 10, lines 60-61; and Figure 29. However, Zarling et al fail to teach that the laser dye binds to gamma globulin.

Ekong et al reference teaches labeled IgG as a secondary antibody in an immunoassay, in order to detect botulinum neurotoxin type A. See abstract.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Zarling et al with labeled IgG as a secondary antibody in an immunoassay, as taught by Ekong et al, in order to detect botulinum

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neurotoxin type A. The labeled IgG of Ekong et al would provide the advantage of detecting a potent neurotoxin in the apparatus of Zarling et al. In addition, one of ordinary skill in the art at the time of the invention would have had reasonable expectation of success in including labeled IgG, as taught by Ekong et al, in the apparatus of Zarling et al, since Zarling et al teach labeled antibodies as probes, and the labeled IgG of Ekong et al is a secondary antibody, which is considered to be a type of probe.

20. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarling et al (US 5,674,698) in view of Ekong et al (Journal of Immunological Methods, 1995) as applied to claims 7 and 17-18 above, and further in view of Baars et al (Analytical Chemistry, 1999).

Zarling et al and Ekong et al references have been disclosed above, but fail to teach that the laser dye has the formula $C_{45}H_{48}N_3O_{13}S_5Na_3$.

Baars et al reference teaches NN382 dye, in order to provide a NIR fluorescent dye suitable for the labeling of primary amine groups and remains soluble due to sulfonate groups. See page 670, right column, last paragraph to page 671, left column, 1st paragraph.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Zarling et al and Ekong et al with NN382 dye, as taught by Baars et al, in order to provide a NIR fluorescent dye suitable for the labeling of primary amine groups and remains soluble due to sulfonate groups. The NN382 dye,

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as taught by Baars et al, provides the advantage of remaining soluble through the wicking process in the apparatus of Zarling et al and Ekong et al. In addition, one of ordinary skill in the art at the time of the invention would have had reasonable expectation of success in including NN382 dye, as taught by Baars et al, in the apparatus of Zarling et al and Ekong et al, since Zarling et al and Ekong et al teach NIR dyes, and NN382 is one type of NIR dye.

Conclusion

21. No claims are allowed.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Y. Lum whose telephone number is (571) 272-2878. The examiner can normally be reached on weekdays from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

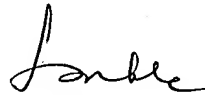
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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leon Y. Lum
Patent Examiner
Art Unit 1641



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08/05/05